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APPENDIX 5B. SAMPLE TEAR-DOWN REPORT

5B.1 FIVE-HORSEPOWER NEMA DESIGN B, 4-POLE ELECTRIC MOTOR TEAR-DOWN REPORT

The U.S. Department of Energy (DOE) derived the electric motor production and material costs for the engineering analysis by purchasing a sample of electric motors, and then having a professional motor testing laboratory disassemble each motor and inventory the component parts. DOE performed tear downs on the electric motors representing candidate standard level (CSL) 0, CSL 1, CSL 2, and CSL 3 for the National Electrical Manufacturers Association (NEMA) Design B equipment-class group (equipment-class group 1), as well as electric motors representing CSL 0 for the NEMA Design C equipment-class group (equipment-class group 2). These tear-downs provided DOE the necessary data to construct a bill of materials that DOE could normalize, using a standard cost model and markup, to produce a projected manufacturer selling price. Table 5B.1 shows a sample tear-down report for one of the five-horsepower (5-HP) NEMA Design B, 4-pole, totally enclosed, fan cooled electric motors purchased by DOE.

Table 5B.1 Sample Tear-Down Report of a 5-HP, NEMA Design B, Electric Motor

Stator Assembly		
Steel Laminations	22.1	lb
Copper Wire	10.1	lb
Rotor Assembly		
Steel Laminations	12.4	lb
Aluminum (Cast)	2.9	lb
Shaft	4.8	lb
Front Bearing	1.0	ea
Back Bearing	1.0	ea
Frame Costs		
Frame and Base Mount	9.1	lb
Static Frame HW Costs		
Terminal Housing	1.0	lb
Rear-End Bell Cast	2.1	lb
Drive-End Bell Cast	12.0	lb
Fan Cover	1.4	lb
Stator Insulation		
Slot Liner (Nomex)	3.7	sq-ft
Top Stick (Nomex)	3.7	sq-ft
Coil Extension Insulation (Phase Paper)	1.0	sq-ft
Lead Wire Thermal Insulation Sleeve	1.0	Ea
Lead Wire	0.25	lb
Lace Cord	37.0	ft

Varnish	0.03	Gal
Miscellaneous Hardware		
Fan Cover (Plastic)	1.0	ea
Fan (Plastic)	1.0	ea
Fan Spring Clip (Steel)	1.0	ea
Axial Thrust Nut Ring 2 Holes (Steel)	1.0	ea
Thrust Bolt Cover (Rubber)	1.0	ea
Wave Spring (Steel)	1.0	ea
Terminal Housing Cover (Steel)	1.0	ea
Terminal Housing Base Gasket (Foam)	1.0	ea
Terminal Housing Cover Gasket (Foam)	1.0	ea
Lifting Eye	1.0	ea
Grease Port Bolts	4.0	ea
Grounding Screw	1.0	ea
Terminal Housing Mounting Bolts (1/4-20 x .5)	4.0	ea
Terminal Housing Cover Bolts (#10 x .375)	2.0	ea
Axial Thrust Bolts (#10 x 1.75)	2.0	ea
Stator Tie Bolts (6 mm x 10.5)	4.0	ea
Fan Cover Bolts (1/4-20 x .5)	2.0	ea